

## SOME CALIFORNIA BEES

BY T. D. A. COCKERELL

During June and July of the present year (1934) I had the opportunity of working with Mr. P. H. Timberlake at the Citrus Experiment Station at Riverside, California. Mr. Timberlake has long studied the bees of the Pacific Coast Region of North America and has built up a collection which is unexcelled for the perfection of the mounting, the length of the series, the accuracy and detail of the data, and the care with which the specimens are sorted out into species. The collection is kept under the best conditions in a new fireproof building. It might be supposed that the bee fauna of California is well known, in view of the very numerous papers dealing with the subject. This is so far from being the case that new species may be discovered almost any day during the season. The climatic and other physical conditions are so varied, and the flora is so rich in peculiar genera and species, that it is not surprising that specific differentiation among the bees has gone far, producing an assemblage of diverse forms, the number of which it would be hazardous to calculate. While I was at Riverside Mr. Chas. D. Michener came in with a large collection of bees obtained by him in the region about Pasadena. Although Pasadena is only a short distance from Riverside several of the species were entirely new to Timberlake and presumably all of them undescribed.

The black Osmiine bees described below were sorted out by Mr. Timberlake and handed to me for description. I am entirely indebted to him for the opportunity of studying them and for advice concerning them. Unless otherwise stated, the types are in the collection of the Citrus Experiment Station at Riverside, California.

*Osmia timberlakei* Cockerell, sp. n.

Female. Length about 8 mm., anterior wing 5; robust, black, with white hair, abundant and woolly on face, cheeks, sides of thorax, metathorax, and mainly covering the short broad abdomen, the rather broad pale reddish margins of the tergites showing through, and more or less indications of dark (bare or thinly clothed) bands, especially on second tergite, but in perfectly fresh specimens this might not be so apparent; ventral scopa pure white; head massive, considerably broader than thorax, facial quadrangle about square; eyes black; mandibles broad, tridentate, the apical portion broadly banded with dusky red; labrum black; clypeus dull and excessively

minutely punctured, covered with hair which in front view appears gray; flagellum rich red, black at extreme tip and base; vertex dull and excessively minutely punctured; mesothorax and scutellum dull and excessively minutely and densely punctured; middle of base of metathorax with a transversely oval shining area on which are two pits, the whole like the end of a pig's snout; tegulæ bright red; wings hyaline, very faintly brownish, stigma and nervures dark, but the basal nervures reddish; basal nervures falling a little short of nervulus; recurrent nervures about equally distant from base and apex of second cubital cell; femora stout, bright chestnut red; tibiæ and tarsi black with white hair, the tarsi a little reddish apically; front tibiæ partly red on inner side; spurs pale yellowish.

At flowers of *Palafoxia linearis*, opposite sand dunes, road to Palm Springs, California, April 23, 1933 (Timberlake). Very distinct from all relatives in this fauna (described below) by the bright red femora, these being black in the other species. The maxillary palpi are short, five-jointed; first joint stout, black, immovable; second dark, the others reddish; third joint much the longest; fourth less than half the length of third; fifth minute, slender. Notauli small and weak, linear.

#### *Osmia arefacta* Cockerell, sp. n.

Female (Type). Length about 7 mm., anterior wing 4.4; black, the head and thorax perhaps very faintly greenish but so indistinctly as to be doubtful; abundant long white hair on face, cheeks, tubercles, pleura and metathorax, on thorax above it is dull and distinctly yellowish; head rather oblong, facial quadrangle longer than broad; labrum black; mandibles tridentate, black, very obscurely reddened subapically; flagellum dark red beneath, except basally; vertex very finely and densely punctured; mesothorax and scutellum very finely punctured, shining, area of metathorax shining; tegulæ bright ferruginous, wings brownish; basal nervure meeting nervulus; second cubital cell long, receiving first recurrent nervure about as far from base as length of intercubitus, the second nearer apex; legs black, with white hair, pale orange on inner side of tarsi, tarsi red apically, spurs red; abdomen with the basal half shining, tergites very narrowly red on apical margins and with narrow white hair-bands, broadly interrupted on first, more narrowly on second; ventral scopa pure white. Notauli linear.

Male. Length about 6 mm., anterior wing 4; mandibles bidentate, black, face densely covered with white hair; antennæ black; recurrent nervures about equally distant from base and apex of second cubital cell; sixth tergite simple, apex of abdomen unarmed.

Palm Springs, California, at flowers of *Phacelia distans*, March 24, 1933 (Timberlake). Distinguished from other species by the

bright red tegulæ and black labrum. Herein it resembles *O. robustula* and *O. palmarum*. The former is larger, with pale yellowish ventral scopa; the latter is considerably smaller, and differs as stated in the description below. A superficially similar insect is female *Ashmeadiella opuntiae* Ckll. (specimens from Riverside, determined by Timberlake, on *Opuntia vaseyi*). This is larger with a much larger head, pure black mesothorax and very thick black hind spur. The mandibles are quite different, with a longitudinal shining keel, above which is a large dull black area, and there is a little band of bright orange hair on apical part of upper margin. The first recurrent nervure is more than twice as far from the base of second cubital cell as second from apex.

*Osmia enceliæ* Timberlake MS., sp. n.

Female. Length about 8 mm. (one is smaller, only 7 mm.), robust, black, with mainly white hair, brown on vertex and the very thinly clothed mesothorax (which may be denuded), but abundant and pure white at sides of face, on cheeks, tubercles, pleura and sides of metathorax; eyes slightly greenish, probably more so in life; facial quadrangle longer than broad; mandibles and labrum black; mandibles broad, tridentate, with a conspicuous tuft of red hair just before the apex; an interrupted band of red hair below margin of clypeus; clypeus somewhat shining, very finely punctured, the upper part feebly carinate, the lower part depressed, concave; antennæ black; vertex very densely finely punctured; mesothorax and scutellum hardly shining, closely and coarsely punctured, the scutellum shining anteriorly; area of metathorax shining; tegulæ rather large, pure black; wings dusky, brownish, stigma and nervures dark; basal nervures meeting nervulus; first recurrent nervure more remote from base of second cubital cell than second from apex but the difference is sometimes not very great; legs black, with pale hair, faintly reddish on inner side of tarsi; spurs black; abdomen broad, convex, shining; margins of tergites with narrow white bands, on first broadened at sides and very narrow or interrupted in middle; fifth and sixth tergites with a fine pale pruinosity; ventral scopa reddish brown.

At flowers of *Encelia farinosa*, Andreas Canyon, Palm Springs, California, March 24, 1933 (Timberlake). Distinguished especially by the black tegulæ, brown ventral scopa and patch of red hair on mandibles. The nearest relative is *O. viguieræ*, described below.

The maxillary palpi, which have the apical part red, are very small, but five jointed, there being a minute but distinct apical joint beyond the fourth. Notauli very small and short, linear.

*Osmia viguieræ* Timberlake MS., sp. n.

Female (Type). Like *O. enceliæ*, but mesothorax more finely punctured and slightly shining; clypeus dull, convex, very minutely punctured, not at all carinate, covered when fresh with dull white hair. In both species, the lower margin of clypeus is shining.

Male. Length about 8 mm., hair of face dense and pure white, of upper part of head and mesothorax grayish brown, but a fringe of very long white hairs behind scutellum; mandibles strongly bidentate, faintly reddish subapically; antennæ black; recurrent nervures received near to and about equally distant from ends of second cubital cell; sixth tergite broadly truncate, the lateral margins strongly rounded; sides of tergites 3 to 6 with strong oblique channels along the base of the normally exposed portion.

Both sexes, including type, at flowers of *Viguiera parishii*, Andreas Canyon, Palm Springs, California, female April 24, 1932, male, March 2, 1934 (Timberlake). Female from same locality, March 24, 1933, at flowers of *Encelia farinosa* (Timberlake).

A male from flowers of *Encelia actoni* Elmer, Townsend Pass (or Emigrant Pass?) 3,000 ft. alt., Death Valley, March 11, 1927 (Timberlake), is appreciably different, as follows. Length about 8 mm. (but abdomen less extended), more robust, the abdominal tergites without the lateral sulci; tegulæ with a red spot (instead of all black); sixth tergite with margin broadly rounded; recurrent nervures more distant from ends of second cubital cell. Possibly a distinct race or species. It may be called var. *mortua*.

The maxillary palpi of *O. viguieræ* are very short and stout, 4-jointed; first joint broadly sessile; second cylindrical, black, very stout; third not greatly longer than second; fourth suboval, button-like.

*Osmia robustula* Cockerell, sp. n.

Female. Length about 8.5 mm., anterior wing a little over 5; very robust, black with white woolly hair on head, thorax and abdomen, abundant on face and front, tubercles, pleura and meta-thorax; on abdomen forming large dense tufts at sides of tergites, broad entire bands on tergites 2 and 3, tergites 4 to 6 thinly hairy all over, 4 also with an apical band, narrower than on 3, ventral scopa very pale yellowish; head not unusually large; eyes dark green; facial quadrangle longer than broad, mandibles tridentate, with a broad red band before apex; labrum shining black; clypeus dull, excessively densely and finely punctured, not ridged, the margin narrowly shining; flagellum obscurely brown beneath; vertex

moderately shining, very densely and finely punctured; cheeks hairy; mesothorax and scutellum finely and closely punctured, somewhat shining, not polished; their hair is thin and appears grayish; area of metathorax large, shining; tegulæ clear ferruginous; wings short for size of insect, hyaline, very faintly brownish; nervures dark, basal nervure falling a trifle short of nervulus; second cubital cell long, receiving recurrent nervures about equally distant from base and apex; legs black with much white hair; small joints of tarsi red; hind basitarsi broad; spurs red; abdomen broad, convex, shining, finely punctured.

At flowers of *Lupinus odoratus*, north of Indio, California, April 23, 1927 (Timberlake). Distinguished by the red tegulæ, black labrum and relatively large size. The notauli are linear. They are so in the genus *Hoplitis*, which is generally regarded as a subgenus of *Osmia*.

#### *Osmia xerophila* Cockerell, sp. n.

Female (Type). Similar to *O. robustula*, of which it is perhaps to be considered a race, with the same mandibles, rufescent subapically, black labrum, bright red tegulæ, and red small joints of tarsi; but it is smaller (7.5 mm.), with the knees red, hind basitarsi not so broad, and the abdominal bands yellowish instead of clear white. The basal nervure falls short of nervulus; second cubital cell receives recurrent nervures equally distant from base and apex.

Male. Face and front densely covered with pure white hair; flagellum simple, red beneath; mandibles bidentate, with a little rounded lobe at each side; hair of scutellum distinctly yellowish. apex of abdomen tridentate; the teeth sharp, the lateral ones largest and longest.

Palm Springs, California (Type locality); female at *Cryptanthus*, March 24, 1933; male at *Malva parviflora*, May 21, 1932 (Timberlake). Female also taken at Borego Valley, March 26, 1933 (Timberlake). The maxillary palpi are very minute, with four subequal joints, the fourth with a conspicuous tuft of bristles at end. The notauli are linear.

#### *Osmia phaceliarum* Cockerell, sp. n.

Female. Length about 6 mm., anterior wing about 4; black, head and thorax with rather abundant white hair, the hair on front especially long and abundant; labrum clear red; mandibles with the apical half, except the margin, dusky red; head not very large; facial quadrangle longer than broad, the orbits distinctly converging below; clypeus densely punctured, not shining; flagellum dusky red beneath, except basally; vertex densely punctured; mesothorax and scutellum moderately shining, with close very distinct punctures, and a greenish tinge so obscure as to be doubtful; area of

metathorax shining, with a dull base; tegulae very bright ferruginous; wings dusky hyaline; basal nervure far short of nervulus; second cubital cell rather short; receiving recurrent nervures about equally distant from base and apex; legs black with white hair, yellowish on inner side of tarsi; spurs yellowish white; abdomen shining, with hind margin of tergites rufous, and narrow white hair-bands, denuded or lacking in middle of first three tergites; ventral scopa clear white.

At flowers of *Phacelia distans*, Puente Hills, California, April 12, 1925 (Timberlake). The locality is near Whittier and is not desert. Maxillary palpi very minute, four jointed, the last joint somewhat curved, longer than third. Notauli very small and short, but linear.

#### *Osmia shastensis* Cockerell, sp. n.

Female. Length about 7.5 mm., anterior wing 5.5; black, robust shining, the head and thorax with rather scanty grayish-white hair, abundant on scutellum, metathorax and pleura, the vertex almost bare, and mesothorax very thinly hairy; head massive, larger than thorax, facial quadrangle about square, cheeks broad; distance from lateral ocelli to occiput almost equal to distance between lateral ocelli; mandibles and labrum black; mandibles tridentate; clypeus high, convex, minutely and closely punctured, little shining, not at all ridged, very thinly clothed with dark hairs; apical region of clypeus depressed, with the margin shining; antennae black; vertex finely punctured, moderately shining; mesothorax and scutellum polished on disc; area of metathorax large, shining; tegulae pure black, rather pointed posteriorly; wings dusky, stigma and nervures black; basal nervure meeting nervulus; second cubital cell long, receiving recurrent nervures equally distant from base and apex, or first a little more distant than second; legs black, without evident pale hair, hairs on inner side of tarsi brown; spurs black; abdomen broadly convex, shining, the margins of tergites laterally with rather long white hair, dense and conspicuous on first, not very conspicuous on the others, on third and fourth forming entire or almost entire very thin bands; ventral scopa long and ferruginous. Notauli well developed, linear.

Shasta County, California (E. R. Leach). Distinguished from *O. hemizoniæ* by being smaller, mesothorax polished on disc, eyes not green.

Female. Length about 6.6 mm., anterior wing 5.5; black, hair of head and thorax white and abundant on face, cheeks, pleura and metathorax, but dorsally very thin and appearing somewhat grayish; head large; mandibles tridentate, bright red with the apical margin narrowly black; labrum clear red; clypeus convex, slightly shining, closely and distinctly punctured, with a finely striate effect,

*Osmia rupestris* Cockerell, sp. n.

apical margin very narrowly red; flagellum bright red beneath; vertex dullish, finely punctured; mesothorax and scutellum shining on disc, the punctures distinctly separated; area of metathorax large and shining; tegulae very bright ferruginous, shining; wings brownish, stigma dark reddish; basal nervure falling considerably short of nervulus; second cubital cell receiving recurrent nervures about equally far from base and apex; legs black, with the knees, tibiae more or less at extreme apex, and tarsi red, the front and middle basitarsi suffused with blackish; hind basitarsi broad; spurs yellowish white; abdomen short, broad, convex, shining, with hind margins of tergites narrowly pale red; tergites finely pubescent, except the second, which is mainly bare, though hairy at sides, and with an apical band; basin of first tergite sharply defined, shining; ventral scopa yellowish white. Notauli linear.

At flowers of *Phacelia distans*, Big Rock Creek, California, April 25, 1926 (Timberlake). The locality is on the edge of the Mohave Desert.

Distinguished from *O. phaceliarum* by the larger size, red mandibles and red hind basitarsi. The maxillary palpi are very minute, with four short joints; third not longer than second; fourth cylindrical with a bristle at end.

*Osmia hemizoniae* Cockerell, sp. n.

Female. Length about 9 mm., anterior wing nearly 6; robust, black, hair of head and thorax abundant, dull white on face, cheeks, pleura and metathorax, pale fulvous on upper part of head and thorax; mandibles and labrum black; mandibles broad, tridentate, without any patch of red hair; clypeus very finely and densely but distinctly punctured, with a faint trace of a median ridge; antennae black; vertex dull and excessively densely punctured; mesothorax dullish, closely punctured; scutellum dull, the surface largely hidden by the long hairs; base of metathorax with a transverse undulate shining band, having the form of a flying bird; tegulae black; wings brownish, stigma and nervures dark; basal nervure meets nervulus a little on outer side; second cubital cell receiving first recurrent nervure much more distant from base than second from apex; legs black, with white hair, last tarsal joint red; spurs dark red; abdomen very finely punctured, somewhat shining, tergites with rather narrow, clean cut, faintly ochreous hair-bands, middle of sixth delicately pruinose; ventral scopa very pale yellowish. Notauli linear.

Riverside, California, at flowers of *Hemizonia paniculata*, May 24, 1932 (Timberlake). Distinguished from *O. shastensis* by

being larger, mesothorax dullish and densely punctured, eyes green.

*Chelostoma australe* Ckll. (which Timberlake refers to *Ashmeadiella*) may be compared. It is very different by the first two tergites red at sides, and hind femora swollen and bright red; the labrum is black and strongly bidentate at end, the long sharp teeth diverging; ventral scopa white. In a series, the red at base of abdomen varies, and may be evanescent. *C. australe* visits flowers of *Pentstemon breviflorus* and *P. palmeri*, as observed by Timberlake.

### *Osmia palmarum* Cockerell, sp. n.

Female. Length 5-5.7 mm.; like *O. arefacta* but smaller; mandibles tridentate, apical part dull red; labrum black. Differs from *O. arefacta* by the somewhat shorter and relatively broader head; dull hoary mesothorax and scutellum, with a dull white hair band in suture between them; tegulae smaller; wings clear hyaline; hind margins of tergites reddish. The basal nervure falls just short of nervulus; second cubital cell receives recurrent nervures equally distant from base and apex, or first a trifle nearer to base than second to apex; hind tibiae very densely clothed behind with pure white hair, ventral scopa short and pure white.

It is also very near to *O. phaceliarum*, differing by the black labrum and hoary appearance of mesothorax, with band in scutello-mesothoracic suture (no trace of this in *O. phaceliarum*); also the tegulae are paler and the wings clearer, and the fifth tergite is more densely white pubescent. The hair of thorax above is tinged with yellowish, including that on scutellum, which is pure white in *O. phaceliarum*.

Type from flowers of *Cryptanthus angustifolia*, Palm Springs, California, April 2, 1927, and March 24, 1933 (Timberlake). Also on the same plant 19 miles west of Kane Springs, March 25, 1933 (Timberlake). Notauli linear; mesonotum with a median groove on anterior half.

*Ashmeadiella rhodognatha* Ckll. may be compared. It is larger and has first recurrent nervure considerably more distant from base of second cubital cell. The mandibles are bright red, or darker. The mesothorax has a broad band of white hair along posterior margin, and two spots in front. *A. rhodognatha* was taken by Timberlake at flowers of *Cercidium torreyanum*, in Box Canyon and Painted Canyon.

(To be continued)